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PROJECT SPECIFIC PLAN FOR WASTE PITS REMEDIAL ACTION PROJECT INVESTIGATION OF THE DISPOSAL OF NATIONAL ELECTRIC COIL SOLVENT

WASTE PITS REMEDIAL ACTION PROJECT

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

December 17, 2001

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

10000-PSP-0001
REVISION A
DRAFT

000001

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Revision A, Draft

December 17, 2001

PREPARED BY FLUOR FERNALD FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT NO. DE-AC24-01OH20115

FERNALD ENVIRONMENTAL MONITORING PROJECT

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LIST OF ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
ASL	analytical support level
ccpm	corrected counts per minute
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIS	Characterization Investigation Study
DQO	Data Quality Objective
FACTS	Fernald Analytical Computerized Tracking System
FF	Fluor Fernald, Inc.
FRL	Final Remediation Level
HWMU	hazardous waste management unit
IT	International Technology Corp.
mg/kg	milligram per kilogram
mL	milliliter
NEC	National Electric Coil
OSDF	On-Site Disposal Facility
OU1	Operable Unit 1
PID	photoionization detector
ppm	parts per million
PSP	Project Specific Plan
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RWP	Radiological Work Permit
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SVOC	semi-volatile organic compound
TAL	Target Analyte List
µg/L	micrograms per liter
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
WAO	Waste Acceptance Organization
WPRAP	Waste Pit Remedial Action Project

1.0 INTRODUCTION

1.1 PURPOSE

This project specific plan (PSP) has been developed to investigate the possible presence of National Electric Coil (NEC) solvent contamination in the Fernald Environmental Management Project (FEMP) Waste Storage Area (i.e., waste pits). The following objectives will drive the work performed under this PSP:

- based on the best information currently available, conduct a linear series of borings positioned to intersect the projected location of the disposal trench
- through identification of recovered material, look for evidence of the disposal trench
- determine the absence or presence/concentration of solvent constituents within the proposed borings

This activity will be conducted in support of a FEMP commitment to prepare a contingency plan to isolate and manage any solvent-contaminated media that may be located in the burn pit area due to disposal of the NEC solvents. The activities planned in this PSP are intended to determine if the NEC solvent and any associated listed hazardous waste can be located and identified prior to its segregation and management. Following completion of the investigation planned in this PSP, all associated information, including the laboratory analytical data, field screening results, area topography, soil lithology, and non-soil material identified in the boring cores, will be evaluated to determine if further investigation is necessary. The conclusions from this evaluation, along with the resulting data and any proposed further investigation or isolation and management efforts, will be prepared in a report provided to the regulatory agencies for joint review with WPRAP management. If further field activity is determined to be necessary, it will be proposed as a variance to this PSP.

1.2 BACKGROUND

In April 1977, the contents of eight drums of waste solvent and one drum of waste solvent/sludge shipped to Fernald from NEC in Louisville, Kentucky, were disposed in a trench dug in the FEMP OU1 Waste Storage Area, as shown on Figure 1-1. Although numerous records documented the planning and implementation of the solvent disposal effort, the precise location, dimensions, and details of the disposal trench were not among the project documentation. A 1998 review conducted by Fluor Fernald, Inc. (FF) of historical information noted the most probable disposal location of the NEC solvent waste as being adjacent to the Burn Pit area. Based on the recollection of former production personnel who were either

involved in or observed the disposal effort, a trench estimated to be 6-8 feet deep, 8-10 feet wide, and at least 100 feet long, was excavated by bulldozer in soil at this location. The bottom of the trench was lined with crushed scrap wood and vermiculite. The waste solvent was poured onto this mixture to provide some measure of immobilization. The trench was then back-filled with excavated soil. A drawing of the projected area of disposal is shown on Figure 1-2.

1.3 CONSTITUENTS OF CONCERN

As determined from supplier information, the major constituents of the NEC waste solvent consisted of methylene chloride (65%), cresylic acid (15%; commonly referred to in analytical terms as cresol) and formic acid (10%). Composition of the remaining ten percent is unidentified. Based on their percentage of the solvent mixture, relative chemical persistence in the environment, and inclusion on the Resource Conservation and Recovery Act (RCRA) F-list of hazardous chemicals, methylene chloride and cresol are the most likely solvent constituents to still be detectable. Due to its chemical properties, formic acid is expected to have oxidized in the 24 years since disposal and, thus, is unlikely to still be present. Because of this, samples will be collected and analyzed for the methylene chloride and cresol constituents of the waste solvent.

1.4 SCOPE

Under this PSP, physical samples will be collected from the projected NEC waste solvent trench area to meet the objectives stated in Section 1.1. Following a review of initial investigation results, additional borings and samples may be necessary to vertically and laterally bound a solvent contamination area. Any required additional boring and sampling activities will be identified by a Variance/Field Change Notice to this PSP. Sampling activities carried out under this PSP will be performed in accordance with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), and Data Quality Objective (DQO) SL-059, Revision 0 (Appendix B).

Following receipt of field and analytical data, a report will be written and submitted to the agencies to summarize the investigation and provide conclusions. If it is determined that investigation results indicate RCRA-listed hazardous waste exists, a detailed plan for segregation and management of the area of hazardous waste delineated in the investigation will be proposed for approval. It is anticipated that such a plan would be similar to, or part of, plans for isolation and removal of other above-OSDF WAC or RCRA-listed waste (i.e., the Incinerator Pad; north of the Maintenance Building, etc.) that will be shipped

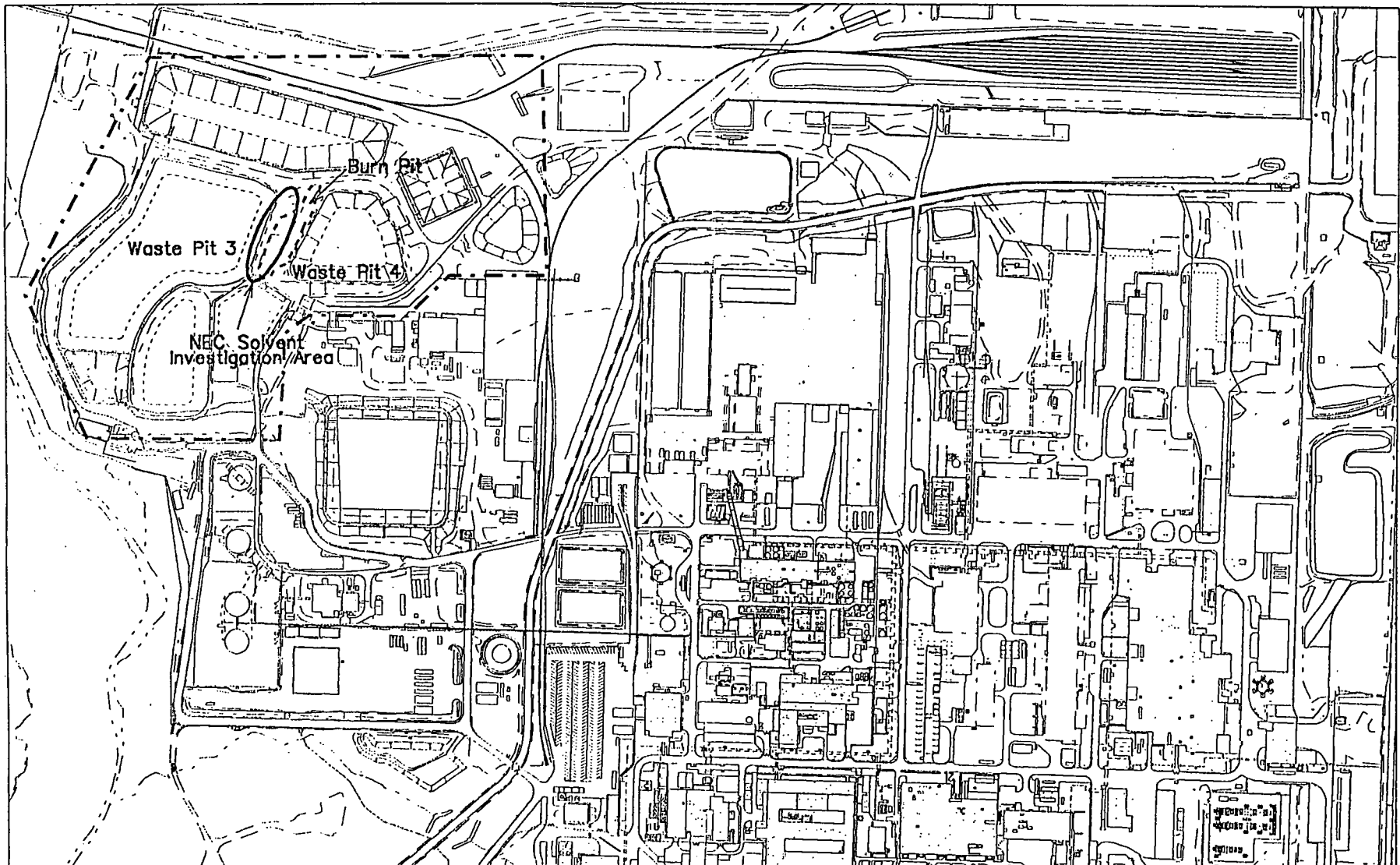
offsite for disposal. Included in such plans may be pretreatment of the waste to meet the WAC of the off-site disposal facility. Specific details of any proposal for management of the waste will be based on mutually-accepted findings of this investigation.

1.5 KEY PROJECT PERSONNEL

The key project personnel are listed in Table 1-1:

TABLE 1-1
KEY PERSONNEL

Title	Primary	Alternate
DOE Contact	Dave Lojek	John Kappa
WPRAP Project Director	Mark Cherry	Monty Morris
WPRAP Technical Support Services Manager	Christine Messerly	Bill Westerman
Field Sampling Lead	Tom Buhrlage	Jim Hey
Surveying Lead	Jim Schwing	Jack McCormack
WAO Contact	Joe Jacoboski	Bob Bischoff
Laboratory Contact	Denise Arico	Brenda Collier
Data Management Lead	Bill Westerman	Christine Messerly
Field Data Validation Contact	Andy Sandfoss	Dee Dee Early
Data Validation Contact	Jim Chambers	Andy Sandfoss
FACTS/SED Database Contact	Cara Sue Schaefer	TBD
Radiological Control	Robert Holley	Russ Hall
WPRAP Pit Excavation Oversight	Marshall Linton	Grant Hale
Quality Assurance Contact	Mike Hoge	Leslie Williams
Health and Safety Contact	Charlie Lineberry	Todd Valli



LEGEND:

— · — · — WASTE STORAGE AREA

SCALE

500 250 0 500 FEET

v:\#2fm12#dgn#burn_070301.dgn
STATE PLANAR COORDINATE SYSTEM 1983

11-JUL-2001

FIGURE 1-1. LOCATION OF NEC SOLVENT INVESTIGATION AT FEMP

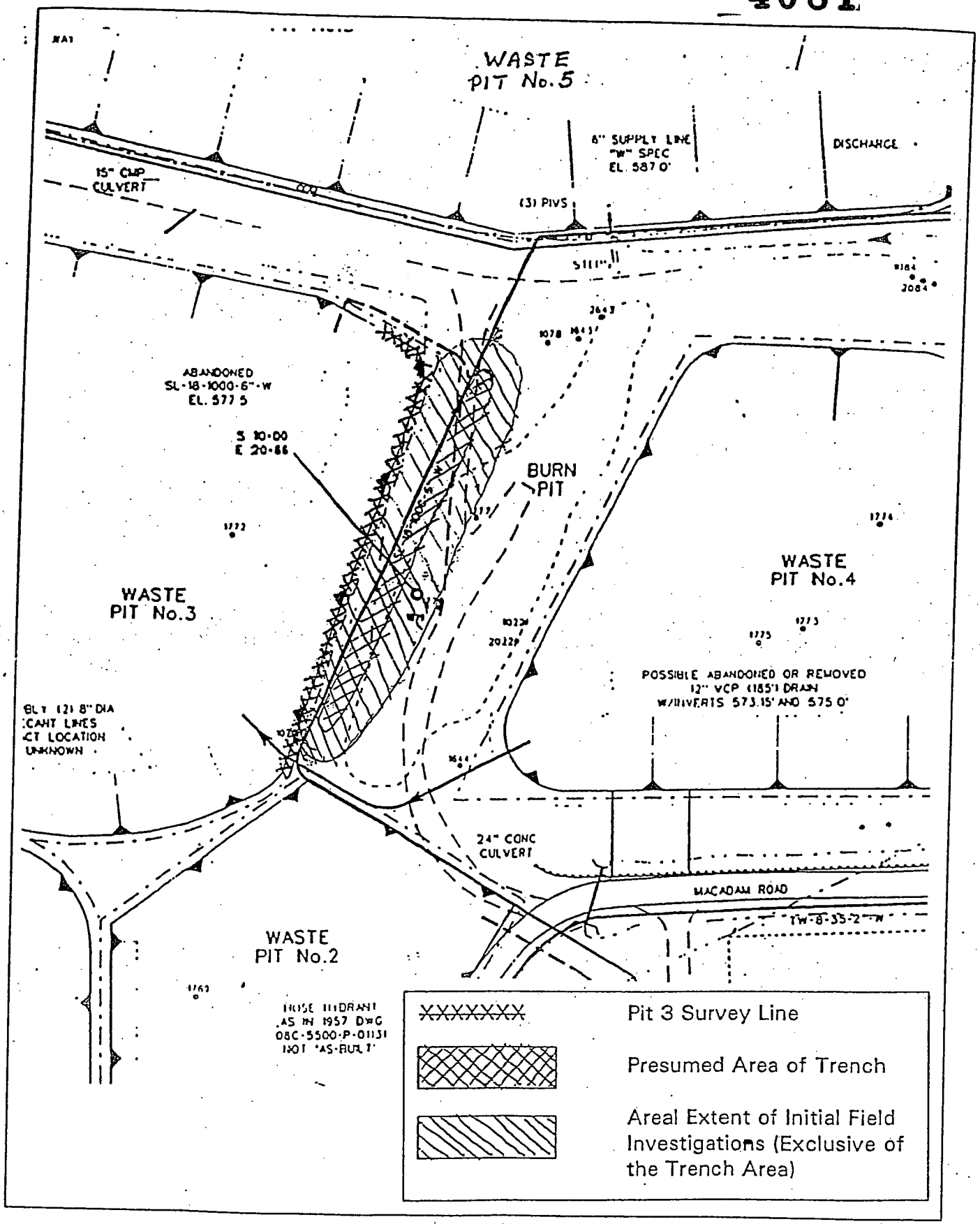


Figure 1-2 Projected Area of NEC Solvent Disposal Trench

2.0 PHYSICAL SAMPLING STRATEGY

2.1 SELECTION OF SAMPLE LOCATIONS

Sample locations were chosen to meet the objectives presented in Section 1.1. The proposed boring locations are presented on Figure 2-1, along with existing Characterization Investigation Study (CIS) and Remedial Investigation/Feasibility Study (RI/FS) boring locations in the area and a buried effluent pipe running between Waste Pit 3 and the Burn Pit.

The seven proposed boring locations (Borings WP-NEC-01 through WP-NEC-07) are located five feet apart along a straight line between CIS Borings 07-03 and 07-04. There is no evidence that any previous borings in the area intersected the solvent disposal trench. Lithological classification logs completed for the CIS borings indicate that Boring 07-03 is located in the Burn Pit and Boring 07-04 is within Waste Pit 3, based on material recovered (glass, metal and wood debris from 07-03; cinder rock from 07-04). As detailed in Section 1, historical information identifying the location of the solvent disposal effort is inconsistent and did not include survey coordinates, maps, or drawings that could be used to establish, with certainty, the location of the disposal trench. Former production worker recollections place the waste solvent trench in this area between Pit 3 and the Burn Pit, parallel to the buried effluent pipe, as depicted on Figure 1-2. Locating the proposed borings five feet apart is designed to ensure that at least one boring will be located within the trench, estimated to be 8-10 feet wide. The location of the proposed borings also lies within the area of an electromagnetic anomaly of unknown origin identified during geophysical mapping of the Waste Storage Area conducted for the Operable Unit 1 (OU1) Remedial Investigation. An outline of this area is identified on Figure 2-1. Prior to sampling, boring locations will be surveyed and marked with flags at the boring coordinates listed in Table 2-1.

At least two samples for methylene chloride and cresol will be collected from each boring. Sampling to a depth of 12 feet allows for the possibility of vertical migration of the solvent from the trench bottom. The entire length of each sample core will be scanned with a photoionization detector (PID) instrument and a sample for each constituent will be collected from the depth interval displaying the highest PID reading. Additional samples at each boring location will be collected from any six-inch interval containing material indicative of the waste solvent disposal trench (i.e., wood chips and/or vermiculite). At any boring without PID hits or trench material, a sample will be collected at 7.5-8 feet below the soil surface, which is

considered the most likely horizon for contamination because of its proximity to the projected trench bottom. A final sample will be collected at the bottom interval of each boring, 11.5-12 feet below the soil surface.

From each boring in which perched water/leachate is encountered, one sample will be collected and analyzed for methylene chloride and cresol.

2.2 SAMPLE COLLECTION METHODS

All soil borings will be completed using the Geoprobe® Model 5400, utilizing the dual tube sampling system to prevent cross-contamination between sample intervals. Soil samples will be collected in accordance with procedure SMPL-01, Solids Sampling. If refusal or resistance is encountered during sample collection, the boring location may be relocated along a line three feet north and south, perpendicular to the line between CIS Borings 07-03 and 07-04. If the boring must be relocated greater than 3 feet from the originally planned sample point, the change must be documented on a V/FCN form, as described in Section 3.4.

Prior to collection of the soil cores, the field sampling technician will remove any surface vegetation within a 6-inch radius from the point to be sampled, using a clean-gloved hand and taking care not to remove any of the surface soil. When sampling below overlying material (i.e., gravel or rock), the uppermost sampling interval will begin where the soil contains less than 50 percent gravel. Any debris (e.g., wood, glass, metal) contained in the sample intervals will be removed. The Geoprobe® will be driven to the appropriate depth and, upon removal, all cores will be laid out on clean plastic.

The entire length of each boring will be screened using a photoionization detector (PID). The Geoprobe® cores liners will be opened for PID screening. The measurement for each 6-inch sample interval (not including any material overlying the soil surface) will be recorded in the field documentation. The 6-inch sample interval with the highest reading from each boring will be collected and submitted for both methylene chloride and cresol analysis. If no PID hits are recorded, the six-inch interval at the projected bottom depth of the trench, 7.5 to 8 feet below the soil surface, will be collected.

The entire length of each soil core will also be surveyed with a beta/gamma (Geiger-Mueller) survey meter and all survey results will be recorded in the field documentation. A sample will be collected from the interval with the highest reading in each boring and submitted to the on-site laboratory for alpha/beta analysis. If all intervals read background, the alpha/beta sample will be collected from the first six-inch interval below the soil surface.

Following PID and beta/gamma screening, the appropriate sample intervals, as specified in Section 2.1 [i.e., bottom interval of boring (11.5-12 feet), any intervals with vermiculite/wood, and the interval with the highest PID hit, or if none, the interval at 7.5-8 feet below the soil surface, the estimated depth of the trench bottom] will be collected. Sample volume and analysis information are summarized in Table 2-2. A visual description of the full length of each sample core, with particular emphasis on notation of any indications of wood, vermiculite, cinder ash, or any other non-native type material, will be recorded as part of the field documentation. All samples will be delivered to the on-site Sample Processing Laboratory, where the methylene chloride (VOC) and cresol (SVOC) samples will be prepared for shipment to an approved off-site laboratory, in accordance with procedure 9501, Shipping Samples to Off-Site Laboratories. The alpha/beta screening samples will be analyzed onsite to provide radiological activity information for the off-site shipment. All samples will be analyzed for the appropriate Target Analyte List (TAL), as identified in Appendix B.

2.3 SAMPLE IDENTIFICATION

All physical samples collected for laboratory analysis will be assigned a unique sample identifier. This identifier will consist of the boring location designation, followed by a depth interval identification (1= 0-0.5 feet below surface, 2= 0.5-1.0 feet below surface, etc.), followed by designation of the QC sample type, if applicable ("D" for duplicate sample, "FB" for field blank, "TB" for Trip Blank, and "X" for rinsate), followed by a letter designating the category of analysis of the sample ("L" for VOCs, "S" for SVOCs, and "AB" for alpha/beta screening). For example, WP-NEC-03-17-S is a sample collected from the 8.0-8.5 foot interval of Boring WP-NEC-03 for SVOC (cresol) analysis. Sample identifier WP-NEC-TB1-L would be the first daily trip blank for VOC (methylene chloride) analysis. Note that the depth interval is recorded in 6-inch intervals from the surface, to account for any material overlying the soil. Overlying material depth will be calculated to the nearest 6-inch interval. Thus, a sample collected from six to twelve inches below the soil surface, overlaid with 11 inches of gravel, would be recorded as collected from sample interval four.

If a boring location requires multiple borings due to subsurface refusal, or if a boring is moved after attempting the original location, the boring identifier will be designated with an alphabetic suffix (e.g., WP-NEC-02A, WP-NEC-02B, etc.). Therefore, a VOC sample collected from the 11.5-12 foot interval of the third attempt at Boring WP-NEC-07 would be WP-NEC-07B-24-L.

2.4 EQUIPMENT DECONTAMINATION

Decontamination is performed on the sampling equipment to protect worker health and safety and to prevent the introduction of contaminants into subsequent soil samples. Sampling equipment will be decontaminated prior to transport to the field site, between sample locations, and after sampling performed under this PSP is completed. Equipment that comes into contact with sample material will be decontaminated at Level II (Section K.11, SCQ). Other equipment that does not contact sample media may be decontaminated at Level I, or wiped down using disposable towels. Clean disposable wipes may be used to replace air drying of the equipment.

2.5 SAMPLING WASTE DISPOSITION

Excess soil from the borings will be containerized for later disposition. Any water (used decontamination water, excess perched groundwater, etc.) generated during sampling will be disposed at a wastewater discharge sump located within the waste pits area.

2.6 BOREHOLE ABANDONMENT

Each borehole will be plugged using bentonite pellets or a bentonite grout slurry immediately after sampling is completed. If pellets are used, they will be placed in the borehole in 2-foot intervals, then hydrated with potable water. The field lead will direct the field team on which abandonment option will be used. A Borehole Abandonment Log will be completed for each borehole.

TABLE 2-1

BORING IDENTIFICATION NUMBERS AND COORDINATES

Boring Id	Northing	Easting
WP-NEC-01	481738.11	1347127.42
WP-NEC-02	481738.24	1347122.42
WP-NEC-03	481738.38	1347117.42
WP-NEC-04	481738.52	1347112.42
WP-NEC-05	481738.71	1347105.42
WP-NEC-06	481738.85	1347100.42
WP-NEC-07	481738.98	1347095.42

TABLE 2-2

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Required Detection Limit	Sample Matrix	Lab	ASL	Preservation	Holding Time	Container	Sample Volume/ Mass
VOC Methylene Chloride (TAL A)	10 ug/kg	Solid	Off-site	D	Cool 2°-6° C	14 days	glass w/ Teflon cap	30 grams. fill to no headspace
VOC Methylene Chloride (TAL A)	10 ug/L	Liquid (QC or perched water/leachate)	Off-site	D	Cool 2°-6° C H_2SO_4, pH < 2	14 days	3 x 40-mL glass w/ Teflon cap	3 x 40-mL. fill to no headspace
SVOC Cresol (TAL B)	330 ug/kg	Solid	Off-site	D	Cool 2°-6° C	14 days	glass w/ Teflon cap	50 grams[a]. fill to no headspace
SVOC Cresol (TAL B)	10 ug/L	Liquid (QC or perched water/leachate)	Off-site	D	Cool 2°-6° C	7/40[b] days	amber glass w/ Teflon cap	4 Liters
alpha/beta screen	N/A	Solid	On-site	B	none	N/A	any	10 grams

[a] One sample from each off-site sample shipment must have at least 100 grams of material for laboratory QC

[b] Seven days to do extraction; 40 days to analyze extract

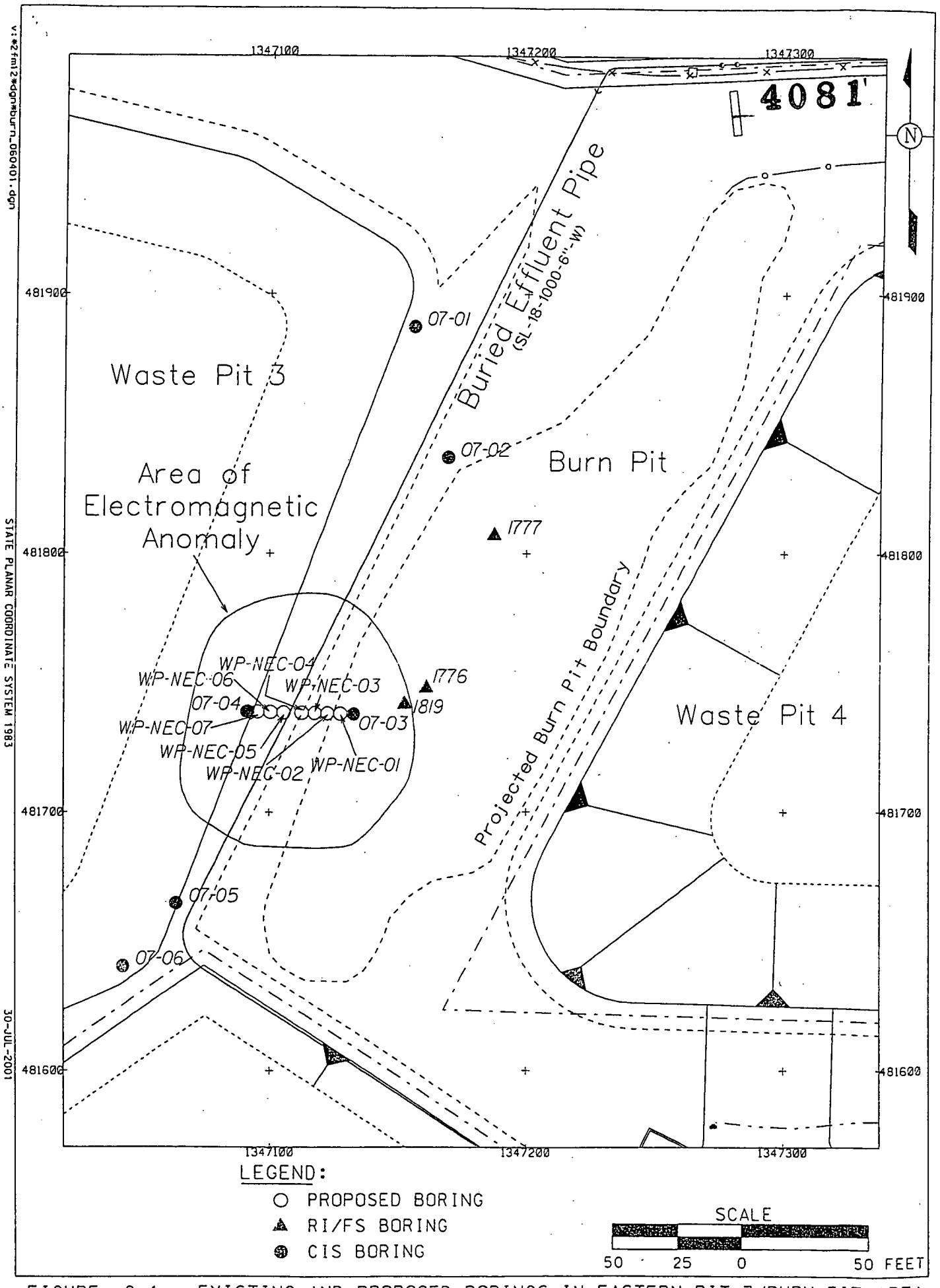


FIGURE 2-1. EXISTING AND PROPOSED BORINGS IN EASTERN PIT 3/BURN PIT AREA

3.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

3.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

In accordance with the requirements of DQO SL-059, Revision 0 (see Appendix B), the field quality control, analytical, and data validation requirements are as follows:

- All laboratory analyses will be performed at ASL D (ASLs are defined in the SCQ).
- One trip blank will be taken each day that VOC samples are collected or one per 20 VOC samples that are collected, whichever is more frequent. One field blank will be collected for the sampling project; one equipment rinsate and one duplicate sample will also be collected per every 20 samples. In addition, a sample selected for lab matrix spike and matrix spike duplicate (requires additional soil; see Table 2-2) will be designated by the Sampling Lead on the Chain of Custody form for each shipment of samples sent for off-site analysis.
- All field data will be validated. All analytical data will be validated to ASL D and require a certificate of analysis and associated quality assurance/quality control results.

3.2 PROJECT-SPECIFIC PROCEDURES, MANUALS AND DOCUMENTS

To assure consistency and data integrity, field activities in support of this PSP will follow the requirements and responsibilities outlined in controlled procedures and manufacturer operational manuals. Applicable procedures, manuals, and documents include:

- SMPL-01, Solids Sampling
- SMPL-02, Liquids and Sludge Sampling
- SMPL-21, Collection of Field Quality Control Samples
- EQT-04, Photoionization Detector
- EQT-06, Geoprobe® Model 5400 Operation and Maintenance Manual
- EW-0002, Chain of Custody/Request for Analysis Record for Sample Control
- 5507, Drying and Grinding Solid Samples in Preparation for Laboratory Analysis
- 9503, Processing Samples through the Sample Processing Laboratory
- 9505, Using the FACTS Database to Process Samples
- 7532, Analytical Laboratory Services Internal Chain of Custody
- 9501, Shipping Samples to Off-Site Laboratories
- RM-0020, Radiological Control Requirements Manual
- 10500-H1, International Technology (IT) Health and Safety Program
- 10500-017, IT WPRAP Excavation Plan
- Sitewide CERCLA Quality Assurance Project Plan (SCQ)

3.3 PROJECT REQUIREMENTS FOR INDEPENDENT ASSESSMENTS

Project management has ultimate responsibility for the quality of the work processes and the results of the sampling activities covered by this PSP. The QA organization may conduct independent assessments of the work processes and operations to assure the quality of performance. Assessments will encompass technical and procedural requirements of this PSP and the SCQ.

3.4 IMPLEMENTATION OF FIELD CHANGES

If field conditions require changes or variances, the project manager must prepare a V/FCN. The completed V/FCN must contain the signatures of all affected organizations, which at a minimum includes the Project Manager, Technical Support Services Manager, and Quality Assurance (QA), but may also include Field Sampling, or Sample Management Office, as appropriate. A time-critical variance may be obtained in cases where expedited approval is needed to avoid costly project delays. In the case of a time-critical variance, verbal or written approval (electronic mail is acceptable) must be received from the Technical Support Services Manager and from QA prior to implementing the variance. The completed approved V/FCN form must be completed within five working days after the time-critical variance is approved.

4.0 HEALTH AND SAFETY

The Fluor Fernald (FF) and International Technology (IT) Excavation Managers, IT Health and Safety Lead, Field Sampling Leads, and team members will assess the safety of performing sampling activities in the Waste Storage Area. This will include vehicle/equipment positioning limitations and fall hazards.

Sample technicians will conform to precautionary surveys performed by Radiological Control, Safety, and Industrial Hygiene personnel. All work on this project will be performed in accordance with applicable Environmental Monitoring procedures, RM-0020 (Radiological Control Requirements Manual), IT Health and Safety Plan, FF work permit, Radiological Work Permit (RWP), penetration permit and other applicable permits. Concurrence with applicable safety permits (as indicated by the signature of each field team member assigned to this project) is required by each team member in the performance of their assigned duties.

Sampling technicians will also comply with any specific requirements for activity conducted within the waste pits area, including the Excavation Plan, the non-typical waste procedure, access restrictions, respiratory requirements, and health and safety briefings that may be required by IT procedures. Any access to the waste pits area must be authorized by a competent (i.e., certified in excavation activity) excavation manager. Members of the sampling team are also required to be on the beryllium monitoring list. Because waste pit excavation and waste hauling activities using heavy equipment may be ongoing during this sampling activity, the sampling team and support personnel must pay special attention to such activities and maintain a safe distance from the heavy equipment work zones as well as ensuring that the heavy equipment operators are aware of their presence.

The Field Sampling Lead will ensure that each technician performing work related to this project has been trained to the relevant sampling procedures including safety precautions. Technicians who do not sign project safety and technical briefing forms will not participate in any activities related to the completion of assigned project responsibilities. A copy of applicable safety permits/surveys issued for worker safety and health will be posted in the affected area during field activities.

A daily safety briefing will be conducted prior to the initiation of field activities. All emergencies will be reported immediately to the IT control room at 648-4496, the site communication center at 648-6511 by cell phone, 911 on-site phone, or by contacting "control" on the radio.

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5.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a Field Activity Log, which should be sufficient for accurate reconstruction of the events at a later date without reliance on memory. Sample Collection Logs will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the field sampling event. At least weekly, a copy of all field logs will be sent to the Data Management Lead.

All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the Field Activity Log, and the Chain of Custody/Request for Analysis Form, as required. The method of sample collection will be specified in the Field Activity Log. Borehole Abandonment Logs are required. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 2.3. This unique sample identifier will appear on the Sample Collection Log and Chain of Custody/Request for Analysis and will be used to identify the samples during analysis, data entry, and data management.

Technicians will review all field data for completeness and accuracy and then forward the data package to the Field Data Validation Contact for final review. The field data package will be filed in the records of the Environmental Management Project. Analytical data that is designated for data validation will be forwarded to the Data Validation Group. The PSP requirements for analytical data validation are outlined in Section 3.1. Analytical data from the on- and off-site laboratories will be reviewed by the Data Management Lead prior to transfer of the data to the Sitewide Environmental Database (SED) from the FACTS database.

Following field and analytical data validation, the Sample Data Management organization will perform data entry into the SED. After entry into the SED, a data group form will be completed for each material tracking location (as identified by WAO) and transmitted to WAO for WAC documentation.

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APPENDIX A

Data Quality Objective SL-059, Rev. 0

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Investigation of NEC Waste Solvent Trench

Number: SL-059

Revision: 0

Effective Date: August 9, 2001

Contact Name: Bill Westerman

Approval: _____ Date: 8/9/01
James Chambers
DQO Coordinator

Approval: _____ Date: 8-9-01
Mark Cherry
WPRAP Project Manager

Rev. #	0						
Effective Date:	8/09/01						

DATA QUALITY OBJECTIVES
Sitewide Certification Sampling and Analysis

Members of Data Quality Objectives (DQO) Scoping Team

The members of the scoping team included individuals with expertise in QA, analytical methods, field sampling, statistics, laboratory analytical methods and data management.

Conceptual Model of the Site

Soil sampling was conducted at the Fernald Environmental Management Project (FEMP) during the Operable Unit 5 (OU5) Remedial Investigation/Feasibility Study (RI/FS). Sampling of the waste in the Waste Pit Area was conducted during the Operable Unit 1 (OU1) RI/FS. The extent of specific media contamination was estimated and published in the OU5 FS and the OU1 FS. These estimates were based on analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. During the course of remediation, areas of specific media may require additional characterization so remediation and excavation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level. Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled.

1.0 Statement of Problem

Waste solvent may have been buried in a trench near the burn pit. Since the extent (depth and/or area) of the media COC contamination is unknown, it must be defined with respect to the appropriate target level. The appropriate sampling, analytical and information management criteria must be developed to provide the required qualified data necessary to demonstrate characterization of the area. The appropriate analytical methodologies must be selected to provide the required data.

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in the area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-specific plan will identify the optimal sampling density.

Methods of Sampling and Analysis

Physical soil samples will be collected in accordance with the applicable site sampling procedures. Laboratory analysis will be conducted at ASL D using QA/QC protocols specified in the SCQ. Full raw data deliverables will be required from the laboratory to allow for appropriate data validation. For FEMP-approved on- and off-site laboratories, the analytical method used will meet the required precision, accuracy and detection capabilities necessary to achieve analyte ranges of the appropriate target level.

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Spatial Boundaries - The boundaries of this DQO extend to the investigation area, which lies between Waste Pit 3 and the Burn Pit.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level and the delineation of the waste solvent trench area.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision-maker determines that the extent of media contaminated with COCs above action levels is not as extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF or an off-site disposal facility.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the desired action level is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Useable Data

7.1 Sample Collection

Existing data, process knowledge, and the origins of contamination were used to determine the COCs and lateral and vertical extent of sample collection. The PSP will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with fieldwork requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, including data obtained from physical samples and information obtained through PID screening. A very conservative approach to delineation may also be utilized where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory Analysis
As defined in the PSP, samples will be submitted to the on-site laboratory or a FDF approved off-site laboratory for analysis. All chemical analyses (i.e., VOC and SVOC) will meet ASL D and alpha/beta screen will meet ASL B requirements per the SCQ.

Validation
All field data will be validated. All analytical data from each laboratory will be subject to analytical validation to ASL D requirements in the SCQ, and will require an ASL D package.

Data Quality Objectives
Sitewide Certification Sampling and Analysis

1.A. Task/Description: Certification Sampling and Analysis

1.B. Project Phase: (Circle the appropriate selection.)

RI FS [RD] RA RvA Other (specify)

1.C. DQO No.:_____ DQO Reference No.:_____

2. Media Characterization: (Circle the appropriate selection(s).)

Air	[Groundwater]	[Soil]	Waste	Other (specify)
Biological	Sediment	Surface Water	Waste Water	

3. Data Use with Analytical Support Level (A-E): (Circle the appropriate Analytical Support Level selection(s) for each applicable Data Use.)

Site Characterization	A	B	C	[D]	E	Risk Assessment	A	B	C	[D]	E
Evaluation of Alternatives	A	B	C	[D]	E	Engineering Design	A	B	C	D	E
Monitoring during remediation activities	A	B	C	D	E	Other (Certification)	A	B	C	D	E

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU1 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

5. Site Information (Description): The OU1 Remedial Action Plan (RAP) has identified areas in the Waste Storage Area (i.e., the waste pits) at the FEMP that require excavation activities. The RAP specifies that the waste in this area will be demonstrated to be below the WAC for disposal at an offsite facility. Further investigation to determine if NEC waste solvent material creates RCRA listed hazardous waste requiring segregation and special handling.

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Circle the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1.	pH Temperature Specific Cond. Diss. Oxygen Technetium-99	2.	Uranium Full Radiological Metals Cyanide Silica	3.	BTX TPH Oil/Grease
4.	Cations Anions TOC TCLP CEC COD	5.	VOA BNA Pesticides PCBs	6.	Other (Specify) Alpha/Beta screen

6.B. Equipment Selection and SCQ Reference:

	Equipment Selection	SCQ Reference	
ASL A		SCQ Section:	
ASL B		SCQ Section:	
ASL C		SCQ Section:	
ASL D	Per SCQ and PSP	SCQ Section:	App. G1&G2; App. K
ASL E		SCQ Section:	

7.A. Sampling Methods: (Circle the appropriate selection(s).)

Biased	Composite	Environmental	Grab	Grid
Intrusive	Nonintrusive	Random	Phased	Source

7.B. Sample Work Plan Reference: Project Specific Plan for the associated Remediation area Remedial Action Work Plan

Background samples: OU1 RI

7.C. Sample Collection Reference:

Sample Collection Reference: Associated PSP, SMPL-01

8. Quality Control Samples: (Circle the appropriate selection.)

8.A. Field Quality Control Samples:

Trip Blanks (VOCs Only)	Container Blanks
Field Blanks	Duplicate Samples
Equipment Rinsate Samples	Split Samples ***
Preservative Blanks	Performance Evaluation Samples
Other (specify)	

**As noted in the PSP

*** Split samples will be collected where required by the EPA.

8.B. Laboratory Quality Control Samples:

Method Blank	Matrix Duplicate/Replicate
Matrix Spike	Surrogate Spikes
Tracer Spike	
Other (specify)	

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

The location of the trench used for waste solvent disposal was poorly documented. Information from various sources, including production worker recollections, was used to determine the area to be investigated. This information will be included in the PSP text.

APPENDIX B

Target Analyte Lists

- 4081

TARGET ANALYTE LISTS

TAL 10000-PSP-0001-A

Soil and Water VOC Analysis, Offsite		
1	ASL D	Methylene Chloride

TAL 10000-PSP-0001-B

Soil and Water SVOC Analysis, Offsite		
1	ASL D	Cresol